REMARKS

This Amendment is being filed with a Request for Continued Examination in compliance with 37 C.F.R. § 1.114. All objections and rejections are respectfully traversed.

Please enter and consider the Amendment After Final Rejection Under 37 C.F.R. 1.116 filed on June 27, 2005.

Claims 1-36 are pending in the case.

Claims 20, 28 and 34 were objected to as being dependent upon a rejected base claim. Amendment of these claims in the Rule 116 Amendment filed on June 27, 2005 is believed to satisfy this objection.

Claim 36 was rejected in the final Office Action mailed on April 27, 2005 under 35 U.S.C. 101.

Claim 36 is hereby cancelled without prejudice, thus obviating the claim rejections pursuant to 35 U.S.C. § 101.

Claims 1-3, 5-11, 13-16, 21-24, 29-30 and 35-36 were rejected under 35 U.S.C. § 102(b) as being anticipated by United States Patent No. 5,872,906 of Morita et al. which issued on February 16, 1999 ("Morita").

Applicant's invention as set forth in representative claim 1 comprises in part:

> A method for a file server to allocate a spare disk to replace a failed disk in a network storage system, comprising the steps of:

identifying a set of spare disks, *the set of spare disks attached to a plurality of filers of the network storage system*;

choosing a best spare disk of the set of spare disks *the best spare disk attached to any of the filers of the plurality of filers*; and

claiming ownership of the best spare disk.

Morita discloses a method and apparatus for taking counter measures for failures in a single disk array so that selection of an alternative destination for a spare disk unit is optimized, and deterioration of performance and data reconstruction upon a failure is prevented. The disks are attached to the host computer 10 by a common bus structure, 18-1, 18-2. Spare disks are selected in accordance with the teachings of Morita, based upon their parity rank and parity port in the disk array. This selection is made in order to preserve the parity groups in the disk array. More specifically, at Column 4, beginning at line 30, Morita states:

> By selecting most preferentially the spare disk unit existing
> in the ports other than the parity group to which the failure disk unit
> belongs as an alternative destination and by executing the data re-
> constructing process, it is possible to certainly prevent that two or
> more disk units included in the same parity group are allocated to
> the same port after the data was reconstructed.

Applicant respectfully urges that Morita is silent concerning Applicant's claimed novel steps of *identifying a set of spare disks, the set of spare disks attached to a plurality of filers of the network storage system, and choosing a best spare disk of the set of spare disks, the best spare disk attached to any of the filers of the plurality of filers.*

In sharp contrast, Applicant's claimed invention is not directed to a single disk array coupled by a common bus to the file server (host computer 10) as in Morita. Instead,

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Applicant's claimed invention relates to a network storage system having a plurality of filers. Specifically, Applicant's claimed invention provides a solution to the prior requirement of separately allocating a full set of spare disks to each filer, on a filer-by-filer basis in a network storage system. This resulted in situations in which one particular filer may run out of spare disks, but another filer in the system may still have excess spare disks. (Specification, page 3, lines 24 – 28).

Morita cannot solve this problem because Morita's system has one disk array coupled to one host computer by a common bus structure.

Applicant's invention does solve the above-described problem by allowing disks interconnected by a switch to be a common resource to any of the filers, as illustrated in Figs. 1 and 4. As shown in Fig. 1, for example, the red filer can access any of the disks interconnected with switches S2 and S3, which includes the disks associated with fiber channel loops 132, 134 and 136. Notably, the spare disks do not have to conform to a particular rank or port with respect to the parity structure of a RAID group, as required by Morita. Moreover, Morita teaches away from Applicant's invention because Morita's disk array is associated with one particular host computer (acting as a filer) and thus teaches the type of "filer-by- filer" structure that Applicant's invention seeks to avoid.

Accordingly, Applicant respectfully urges that Morita is legally precluded from anticipating the presently claimed invention under 35 U.S.C. § 102 because of the absence from Morita of any disclosure of Applicant's claimed novel step of *identifying a set of spare disks, the set of spare disks attached to a plurality of filers of the network*

storage system, and choosing a best spare disk of the set of spare disks, the best spare

disk attached to any of the filers of the plurality of filers.

Claims 4, 12, 17-19, 25-27, and 31-33 were rejected under 35 U.S.C. § 103(a) as

being unpatentable over Morita.

Claim 4 depends upon claim 1 which has previously been distinguished from Mo-

rita as discussed herein. Similarly, claims 12, 17-19, 25-27, and 31-33 are dependent

claims which depend upon independent claims believed to be in condition for allowance

and are thus patentable over Morita.

Response to Examiner's Response to Argument

The Examiner, in the final Office Action mailed April 27, 2005, at page 10, states

that:

"As set out in claim 1, Applicant's spare disks are described as, the set of spare·

disks attached to the network storage system, that is, Applicant's set of spare disks are

attached to the network storage system without regard to the ports, and without regard to

the other identifiers used by Morita." And further states that: "Morita discloses the disk

units 30-00 to 30-05, which include the spare disk, are connected to the common bus

through adaptors, indicating the set of spare disks attached to the network storage system

(see Figures 4, 13 and column 6 lines 33-36 and column 2 lines 33-40)." Office Action

dated 4/27/05, pages 10-11.

By way of response, beginning with Fig. 4 of Morita, the host computer 10 has at-

tached thereto a disk array 28. This is not a network storage system, but instead is a stor-

age system in which a host computer is directly attached to a single disk array and a spare disk must be chosen out of that disk array, not a different disk array.

Fig. 13 illustrates a host computer 10, a controller 12-1 and a single disk array 28. This structure is not a network storage system. Column 6, lines 33 – 36 discusses twenty four disk units 30-00 to 30-35 provided in the disk array 28 and coupled to a common bus. This still does not teach a network storage system in which disks from a different disk array in the storage system can be allocated as spare disks by another filer in the storage system.

Column 2, lines 33-40 in fact teaches away from Applicant's invention because it indicates that "assuming that a failure occurs in the disk unit 30-02 in Fig. 1, the spare disk unit 30-05 allocated to the rank R0 of the failure disk unit 30-02 is first selected in step S1." (Col. 2, lines 37-40). In other words, Morita's system has spare disks previously allocated as spare disks and they act as such whether or not they are needed. This is in contrast to Applicant's whole network of disk arrays attached in a network storage system, any one of which can be allocated as a spare disk as long as it is interconnected to the relevant filer.

Applicant's claimed invention provides for *identifying a set of spare disks, the set of spare disks attached to a plurality of filers of the network storage system, and choosing a best spare disk of the set of spare disks, the best spare disk attached to any of the filers of the plurality of filers*. Thus, any filer may allocate any spare disk to which it is interconnected. Specification, page 10, lines 16 – 18. Applicant's selection of spare disks is not dependent upon the disk's rank (row) or port (column) in the particu-

lar RAID group to which that disk belongs. Morita imposes constraints that are not im-

posed by Applicant's method and system for spare disk storage allocation in a network

storage system, and does not disclose, teach or render unpatentable Applicant's claimed

invention.

Summary

All the claims have been amended herein, either directly, or through dependency.

All of the objections and rejections have been traversed and it is respectfully submitted that the application is in condition for allowance.

Favorable action is respectfully solicited.

Please contact the undersigned in order to advance the prosecution of this application in any respect.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,

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